

## **Section 2**

### **Initial Site Assessment**

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## **Initial Site Assessments**

### **Introduction**

The purpose of an Initial Site Assessment (ISA) is to collect and verify site data at petroleum release sites that are initially ranked as low priority. This data is used to substantiate the low priority ranking and ensure that the release poses no undetected or overlooked high priority risks to human health and the environment.

After the owner or operator (herein “O/O”) completes a 30-Day Report, the DEQ project manager (herein “PM”) will preliminarily rank the release’s priority using the Petroleum Release Site Priority Ranking Sheet in accordance with Technical Guidance Document (TGD) #15. If the priority score is \_\_\_\_ or higher, the PM will require the O/O to prepare a Remedial Investigation Corrective Action Plan (herein “RI CAP”) in accordance with Section 3 of this guidance. It will not be necessary to conduct an ISA under these circumstances.

If the preliminary priority ranking score is \_\_\_\_\_ or lower, the release will be ranked as a low priority, and will not be addressed immediately. The PM will evaluate the reliability and the accuracy of the information known about the release and the site. If the PM determines that all of the entries in the Release Site Priority Ranking Sheet are based on reliable and accurate information, the priority ranking will be finalized based upon guidance published in TGD #15. It will not be necessary to conduct an ISA under these circumstances.

If the PM determines that some entries in the Release Site Priority Ranking Sheet are based on incomplete, unreliable, or inaccurate information, the O/O will be required to conduct an ISA. The ISA will be designed to collect or verify data necessary to accurately and reliably complete the Release Site Priority Ranking Sheet and make a priority ranking decision. The PM will explain what data is necessary and guide the O/O in preparing the ISA Corrective Action Plan (herein “ISA CAP”).

After the O/O conducts the ISA and submits an ISA Report, the PM will reevaluate the Release Site Priority Ranking Sheet results. If the PM determines that all of the entries in the reevaluated ranking are based on reliable and accurate information, the ranking will be finalized based upon guidance published in TGD #15.

### **Procedures for using standardized ISA CAPs and Reports**

#### **ISA CAP**

The DEQ PM will determine what type of ISA data are necessary to complete or substantiate the initial priority ranking and then request the O/O to submit an ISA CAP. Paragraph 6 of the standardized ISA CAP provides a format for investigatory work tasks that may be requested by the PM. The PM will specifically request the scope of work to be completed under the ISA. The O/O will then provide a workplan for the ISA using the corresponding sections in Paragraph 6 of the standardized ISA CAP. The sections of Paragraph 6 that are not within the requested scope of work, will be omitted.

In other words; if the PM requests both an Initial Site History and a Groundwater Check, then the O/O will submit one ISA CAP where Paragraph 6 includes the workplan information for both an Initial Site History (Section 6.6) and for a Groundwater Check (Section 6.8).

Base map preparation, under Section 6.4 of the standardized ISA CAP, may, or may not, be required as part of an ISA CAP or Report. When existing available map data adequately supports site priority-ranking decisions, the PM will not request a base map as part of the ISA CAP or Report.

The ISA CAP will be reviewed by the PM. The PM will approve the ISA CAP if it meets the requirements of the Standardized ISA CAP and site-specific guidance provided by the PM. The O/O will be notified of DEQ's approval and given a timeframe to complete the work outlined in the CAP and submit a report to DEQ. If the release is potentially eligible for reimbursement from the Petroleum Tank Release Compensation Fund under §§ 75-11-301 through 75-11-321, Montana Code Annotated (MCA), the Petroleum Tank Release Compensation Board staff will also be notified of DEQ approval of the ISA CAP.

### **ISA Report**

Once fieldwork is completed and data gathered, the O/O must document the results of the investigation in accordance with the standardized report for an ISA at a Petroleum Release Site (Report\_ISA-01), and any additional guidance provided by the PM. If the O/O identifies any unexpected conditions that may pose an immediate risk to human health or environmental receptors at any time during the investigation, the O/O shall immediately notify the PM and take steps to mitigate the risks.

Owners and operators will complete a single report that will include findings for all investigations conducted under the approved ISA CAP. Paragraphs 7 (Investigative Results) and 8 (Conclusions) of the standardized ISA report will include information related to the investigation(s) completed under the approved ISA CAP. In other words; if the PM requests both an Initial Site History and a Groundwater Check, then the O/O will submit one ISA report where Paragraphs 7 and 8 include only the investigative results and conclusions of an Initial Site History and a Groundwater Check. Paragraphs relating to investigations that were not requested will be noted as "not requested or completed." In the example stated above, Paragraph 12 (Appendices) will also only contain those appendices that are applicable to an Initial Site History and a Groundwater Check.

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**CAP ISA-01**

**Standardized Initial Site Assessment  
Corrective Action Plan Format**

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY PETROLEUM RELEASE SECTION (PRS)  
(Revised September 16, 2004)

The following lists minimal requirements for an Initial Site Assessment (ISA) Corrective Action Plan (CAP). Please omit any section describing tasks that were not requested by the department and note the omission in the ISA report.

1. **COVER LETTER (This letter should be no longer than one page)**
  - 1.1 Date
  - 1.2 Responsible Party's Name and Mailing Address
  - 1.3 Contact Person's Name and Mailing Address (if different from above).
  - 1.4 Subject Line with the following information:  
Corrective Action Plan and Budget for Initial Site Assessment for the petroleum release at (Facility Name, Street Address, Town), MT (Zip Code); DEQ Facility ID (Number) and Release (Number).
  - 1.5 Introductory paragraph containing reference to DEQ's request for corrective action plan, and general scope of work to be conducted (list all types of initial assessment work being addressed in this CAP).
  - 1.6 Consultant's Name, Address and Phone Number (if not on letterhead).
  - 1.7 Name of person who prepared the workplan
2. **BACKGROUND NARRATIVE** (this portion of the workplan should be used as section 4.2 in the ISA Report)
  - 2.1 When, how, and by whom contamination was discovered.
  - 2.2 Type of products stored at site.
  - 2.3 Type of contamination.
  - 2.4 When and who reported the release to DEQ; and who at DEQ recorded the release.
  - 2.5 Summary of initial actions undertaken and by whom.
  - 2.6 Current site status. What work has already been done and what do we already know about the release and its potential threats to human health and the environment?
  - 2.7 Location map — preferably a reproduction of a USGS topographic map.
3. **FACILITY SKETCH/MAP**
  - 3.1 If a true scale map has not been prepared, then a "best estimate" site sketch may be acceptable for simple sites. The facility sketch should show the following:
    - 3.1.1 All known and suspected sources of petroleum (tanks, pipes, dispensers, waste pits, French drains,...etc.) (current and historical).
    - 3.1.2 Facility buildings
    - 3.1.3 Property lines and easements

- 3.1.4 Known and approximate locations of utilities (buried and overhead)
- 3.1.5 Surface cover (asphalt, concrete...etc.)
- 3.1.6 Adjacent buildings and property use
- 3.1.7 Locations of environmental and construction activities pertinent to the release (excavations, test pits, soil borings, samples....etc.)
- 3.1.8 Water wells (include all within map/sketch area — expand area as necessary to include all wells that may be potential receptors)
- 3.1.9 Local land surface slope.
- 3.1.10 Expected or known flow direction of groundwater.
- 3.1.11 Location of surface water bodies
- 3.1.12 North arrow and estimated scale

**4. PURPOSE AND OBJECTIVES OF INVESTIGATION** (this portion of the workplan should be used as section 5.1 of the ISA Report)

["To gather adequate information to determine known and potential risks posed to human health and the environment from Release #\_\_\_. This investigation evaluated (list requested and performed subsections of Section 6 of this CAP)"].

**5. PROPOSED WORK**

- 5.1 Initial site reconnaissance (This may be verbally approved by DEQ project manager prior to workplan approval)
- 5.2 Preparation of workplan (This may be verbally approved by DEQ project manager prior to workplan approval)
- 5.3 Project management
  - 5.3.1 Client consultation
  - 5.3.2 DEQ consultation
  - 5.3.3 Preparing scopes of work and soliciting bids from subcontractors
  - 5.3.4 Telephone calls
  - 5.3.5 Tracking budget
- 5.4 Map preparation (This section should only be completed when the DEQ project manager requests a detailed facility map. Otherwise, a facility sketch from existing data is adequate.)
  - 5.4.1 Site mapping
  - 5.4.2 Drafting
- 5.5 Travel

The corrective action plan should include one or more of the following subsections (6.6 through 6.14). The PRS project manager will provide specific guidance for the scopes of work to be completed in this investigation. Only include those sections that have been requested by the PRS project manager.

- 5.6 Site History (if requested)
  - 5.6.1 Ownership history research (at least back to the time at which the release from the tank could have occurred)
  - 5.6.2 Site operational history research (at least back to the time at which the release from the tank could have occurred)

- 5.6.3 Research all known and suspected leaks, spills, overfills or other releases that occurred at or from the facility.
- 5.6.4 Preparation of maps and/or aerial photographs (if requested/approved)
- 5.7 Receptor/exposure pathway evaluation (if requested)
  - 5.7.1 Identification of all potential receptors in the area.
  - 5.7.2 Identification of migration pathways and discussion of potential completion.
  - 5.7.3 Exposure Potential Discussion
  - 5.7.4 Preparation of maps and/or aerial photographs (if requested/approved)
- 5.8 Groundwater Check (if requested)
  - 5.8.1 Description of methodology (existing supply wells, monitoring wells, direct push...etc.)
  - 5.8.2 Sampling methodology (collection, field screening, and analysis)
  - 5.8.3 Sample location map.
  - 5.8.4 QA/QC plan (may be on-file with DEQ, or included in an appendix)
- 5.9 Groundwater Investigation (if requested)
  - 5.9.1 Description of methodology (existing supply wells, monitoring wells, direct push...etc.)
  - 5.9.2 Sampling methodology (collection, field screening, and analysis)
  - 5.9.3 Sample location map.
  - 5.9.4 QA/QC plan (may be on-file with DEQ, or included in an appendix)
  - 5.9.5 Data compilation and synthesis
  - 5.9.6 Preparation of maps, cross-sections, and/or aerial photographs (if requested/approved)
- 5.10 Soil Investigation (if requested)
  - 5.10.1 Description of methodology (test pits, borings, direct push...etc.)
  - 5.10.2 Sampling methodology (collection, field screening, and analysis)
  - 5.10.3 Sample location map.
  - 5.10.4 QA/QC plan (may be on-file with DEQ, or included in an appendix)
  - 5.10.5 Data compilation and synthesis
  - 5.10.6 Preparation of maps, cross-sections, and/or aerial photographs (if requested/approved)
- 5.11 Utility/Utility Corridor Investigation (if requested)
  - 5.11.1 Utility research [note: a limited amount of research can be pre-approved in order to prepare this workplan]
  - 5.11.2 Description of methodology (test pits, borings, internal inspection...etc.)
  - 5.11.3 Sampling methodology (collection, field screening, and analysis)
  - 5.11.4 Sample location map.
  - 5.11.5 QA/QC plan (may be on-file with DEQ, or included in an appendix)
  - 5.11.6 Data compilation and synthesis
  - 5.11.7 Preparation of maps, cross-sections, and/or aerial photographs (if requested/approved)
- 5.12 Soil Vapor Investigation (if requested)
  - 5.12.1 Description of methodology
  - 5.12.2 Sampling methodology (collection, field screening, and analysis)
  - 5.12.3 Sample location map.
  - 5.12.4 QA/QC plan (may be on-file with DEQ, or included in an appendix)
  - 5.12.5 Data compilation and synthesis (must include field instrument calibration)

- 5.12.6 Preparation of maps, cross-sections, and/or aerial photographs (if requested/approved)
- 5.13 Building/Structure Vapor Survey (if requested)
  - 5.13.1 Description of methodology
  - 5.13.2 Sampling methodology (collection, field screening, and analysis)
  - 5.13.3 Sample location map and diagrams of buildings.
  - 5.13.4 QA/QC plan (may be on-file with DEQ, or included in an appendix)
  - 5.13.5 Data compilation and synthesis (must include field instrument calibration)
  - 5.13.6 Preparation of maps, cross-sections, and/or aerial photographs (if requested/approved)
- 5.14 Other Data Results (if requested)
- 5.15 Report Preparation
  - 5.15.1 Data consolidation and tabulation
  - 5.15.2 Data evaluation
  - 5.15.3 Report writing

## **6. SCHEDULE**

Include times when phases of work will begin, when they will be completed, and when information and reports will be provided to DEQ. If specific dates cannot be determined until after the CAP is approved, then provide general timeframes.

## **7. BUDGET**

## **8. APPENDICES**

- 8.1 Quality assurance/quality control (QA/QC) plan for all methods and sampling proposed (may be on file with DEQ)
- 8.2 Standard operating procedures (SOPs) for all methods and sampling proposed (may be on file with DEQ)
- 8.3 Plan for disposal of all investigation-derived waste.

## **DRAFT**

### **Report\_ISA-01 for Initial Site Assessment at a Petroleum Release Site**

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY PETROLEUM RELEASE SECTION (PRS)  
(Revised September 16, 2004)

The following lists minimal requirements for an ISA Report. Some of the listed sections may not apply to the scope of work conducted under the approved ISA CAP for the release. Omit any section in the Standardized ISA Report form which does not apply to the scope of work conducted under the ISA CAP, and provide an explanation for the omission in the ISA Report.

#### **1. TITLE PAGE**

- 1.1 Title of report [Initial Site Assessment for...]
- 1.2 Facility name.
- 1.3 Facility address.
- 1.4 DEQ Facility ID Number and Release Number.
- 1.5 Responsible parties name, mailing address and phone number.
- 1.6 Consultant's name, address and phone number.
- 1.7 Contact person's name, mailing address and phone number (if different from above).
- 1.8 Date report prepared.
- 1.9 Title and date of approved ISA CAP

#### **2. EXECUTIVE SUMMARY**

- 2.1 Summarizes release information, results of the investigation, conclusions and recommendations.

#### **3. TABLE OF CONTENTS**

- 3.1 Includes titles of report sections and page numbers (please use naming/numbering methodology for main sections listed herein).
- 3.2 List of tables and figures.
- 3.3 List of appendices.

#### **4. INTRODUCTION**

- 4.1 Purpose of investigation [**“To gather adequate information to determine known and potential risks posed to human health and the environment from Release #\_\_\_\_. This investigation evaluated (list requested and performed subsections of Section 7 of this report)”**].
- 4.2 Brief Background of release.
  - 4.2.1 When, how, and by whom contamination was discovered.
  - 4.2.2 Type of products stored at site.
  - 4.2.3 Type of contamination.
  - 4.2.4 When and who reported the release to DEQ.
  - 4.2.5 Summary of initial actions undertaken and by whom.



4.2.6 Current site status. Describe the work completed to address the release, what is known about the release, and what is known about the potential threats to human health and the environment from the release.

4.2.7 Location map — preferably a reproduction of a USGS topographic map.

## 5. INVESTIGATIVE METHODS

5.1 Purpose of investigation.

5.2 Description of methods (backhoe pits, borings and monitoring well installation, vapor sampling, heated headspace sampling, and other field screening methods). A separate description should be described for each method used.

5.3 QA/QC plan (may be on file at DEQ).

5.4 A detailed sampling plan and construction techniques may be referenced and placed in appendices or in standard operating plan (SOP) submitted to DEQ and on file.

## 6. FACILITY SITE MAP (if requested by PRS project manager as part of report)

Facility site map or maps and descriptions or symbols appropriate in scale and scope showing the following within a 500 foot (unless otherwise noted) radius of the site (information may be shown on more than one map for clarity):

6.1 Buildings (on and adjacent to site),

6.2 Existing and former USTs, ASTs, piping, dispensers, and other sources of petroleum,

6.3 Release area or greatest source of contamination (include possible and likely sources of the release (i.e. tanks, pipes, dispenser)),

6.4 Known extent of contamination (use dashed lines where unsure),

6.5 Soil boring, test pit, or other sample locations (if completed),

6.6 Monitoring well locations (if completed),

6.7 Underground utilities on and adjacent to the property (sewer, water, telephone, electric) [must be completed before excavation or drilling],

6.8 Basements and tile drain and sump systems on and adjacent to the property,

6.9 Existing and former USTs, ASTs, piping, dispensers, and other sources of petroleum

6.10 Adjacent buildings (structures),

6.11 Domestic, municipal and irrigation wells,

6.12 Existing and former hazardous material/waste storage areas.

6.13 North arrow and scale

## 7. INVESTIGATIVE RESULTS (include only those discussions that are pertinent to the type(s) of investigation(s) requested by the PM and conducted under the approved ISA CAP)

### 7.1 Initial Site History (if requested and conducted)

7.1.1 The date and circumstances under which the release was discovered. The date the release was reported to DEQ, and the name of the person who initially reported the release to DEQ.

7.1.2 Initial actions undertaken by the owner, the operator, contractors of the owner or operator, consultants or other agents of the owner or operator, or other persons or parties to address the release.

7.1.3 Local map (2-3 city block area) showing utilities, residences, wells, business or building uses (i.e.: children's nursery or machine shop), potential third parties impacted by the release, property lines, and magnitude and extent of soil and groundwater contamination.

- 7.1.4 Topographic map of site and surrounding area.
- 7.1.5 History of the ownership and operation of the facility, going back to the time the release from the tank occurred, or may have occurred, including the following:
  - 7.1.5.1. The name, current address and telephone number of all current owners and operators, and the time period during which they owned or operated the facility.
  - 7.1.5.2. The name, current address and telephone number (if known) of all past owners and operators, and the time period during which each past owner or operator owned or operated the facility.
  - 7.1.5.3. A description of the activities conducted at the site by each current and past owner/operator,
  - 7.1.5.4. A general construction and land use history of the site,
  - 7.1.5.5. Former and existing hazardous material/waste storage areas, lagoons and waste pits located on the site, and
  - 7.1.5.6. Solid and hazardous waste management history of the site.
- 7.1.6 History of operation of petroleum storage tanks (PSTs) since at least the time the release from the tank did or could have occurred at the site, including the following (some or all of this information may be presented in tabular form):
  - 7.1.6.1. Dates of installation and removal of all existing and former tanks located on the site,
  - 7.1.6.2. Volume of all existing and former tank(s),
  - 7.1.6.3. Tank and piping construction material of all existing and former tanks at the site,
  - 7.1.6.4. Tank configuration, piping layout, check valves, for all existing and former tanks at the site,
  - 7.1.6.5. Overfill/spill protection for all existing and former tanks at the site,
  - 7.1.6.6. Cathodic protection, for all existing and former tanks at the site,
  - 7.1.6.7. Date and description of repairs, replacements, or modifications to existing and former tanks, piping, and ancillary equipment at the site,
  - 7.1.6.8. Condition of tank(s) and piping removed from the site, and the location and size of any perforations, or other defects, and the
  - 7.1.6.9. Method and results of product inventory reconciliation for the last twelve months the PST was operated (attach copies of product inventory charts, reports, or records covering the last twelve months the PST was operated).
- 7.1.7 A description of all known and suspected leaks, spills, overfills or other releases from PSTs, or from any other petroleum sources located on the site. The following information should be included for each occurrence:
  - 7.1.7.1. Date of release,
  - 7.1.7.2. Date release was reported to the department,
  - 7.1.7.3. DEQ release number (if assigned),
  - 7.1.7.4. Product released,
  - 7.1.7.5. Quantity lost,
  - 7.1.7.6. Quantity recovered,

- 7.1.7.7. Known or suspected cause of the release,
- 7.1.7.8. Location of the release on the site,
- 7.1.7.9. Cleanup actions taken, and
- 7.1.7.10. Any Offsite effects.

## **7.2 Receptor/exposure pathway evaluation (if conducted)**

### **7.2.1 Receptor Identification**

#### **7.2.1.1 Drinking water**

- 7.2.1.1.1 Groundwater wells
- 7.2.1.1.2 Permeable water mains
- 7.2.1.1.3 Permeable water service connections

#### **7.2.1.2 Vapors in structures**

- 7.2.1.2.1 Residences/public buildings
- 7.2.1.2.2 Utility vaults
- 7.2.1.2.3 Commercial buildings

#### **7.2.1.3 Direct dermal contact with surface soil (< 2ft bgs)**

- 7.2.1.3.1 Residential property
- 7.2.1.3.2 Commercial property
- 7.2.1.3.3 Recreational property

#### **7.2.1.4 Buried utilities**

- 7.2.1.4.1 Open utilities (water, sewer,...)
- 7.2.1.4.2 Close utilities (phone, power,...)

#### **7.2.1.5 Surface water**

- 7.2.1.5.1 Lakes, rivers, ponds
- 7.2.1.5.2 Wetlands
- 7.2.1.5.3 Storm sewers

#### **7.2.1.6 Groundwater (not used for drinking, but protected as 'state water')**

### **7.2.2 Migration Pathway Identification**

- 7.2.2.1 [Identify all potential pathways from the contamination source to all potential receptors identified in Sub-Section 7.2.1. Include one sub-section for each identified receptor.]

### **7.2.3 Exposure Potential Discussion**

- 7.2.4 [Evaluate potential for pathways identified in Sub-Section 7.2.1 to be complete. Include one sub-section for each pathway identified in Sub-Section 7.2.2]

## **7.3 Groundwater check (1 well/sampling point) (if conducted)**

- 7.3.1 Description of monitoring well, or sampling point completion.
- 7.3.2 Field screening results in table form with date and time of measurement, depth, location, penetration measurement if taken; time-series graphs and tables if more than one sampling period.
- 7.3.3 Soil sample results from sampling point construction (vertical extent of contamination).
- 7.3.4 Groundwater sampling results.
- 7.3.5 Drilling or sampling anomalies.

## **7.4 Groundwater investigation (< 4 wells) (if conducted)**

- 7.4.1 Description of monitoring well, or sampling point completion.

- 7.4.2 Field screening results in table form with date and time of measurement, depth, location, penetration measurement if taken; time-series graphs and tables if sampling was conducted over more than one sampling period.
- 7.4.3 Soil sample results from sampling point construction (vertical extent of contamination). Include updated soil contamination extent and magnitude map (if applicable).
- 7.4.4 Geologic cross-section from boring soil information (if applicable).
- 7.4.5 Groundwater sampling results. Tabular format.
- 7.4.6 Depth to water and water table elevation measurements. Tabular format.
- 7.4.7 Water table piezometric surface contour map.
- 7.4.8 Isopleth (iso-concentration) map depicting at least one analyte for each contaminant type (gasoline, diesel...etc.) that best depicts the extent and magnitude of that contaminant. (Consult PM for assistance in selecting appropriate analytes.)
- 7.4.9 Discussion of any sampling or analytical anomalies.

**7.5 Soil investigation (TP, borings, direct push...etc.)** (if conducted)

- 7.5.1 Description of soil from test pits, boring completion, or other sample retrieval methods.
- 7.5.2 Field screening results in table form with date and time of measurement, depth, location, penetration measurement if taken.
- 7.5.3 Soil sample analytical results.
- 7.5.4 Groundwater sampling results (if groundwater is encountered and sampled from excavation/borings).
- 7.5.5 Depth to water and water table elevation measurements (if water is encountered in excavation/borings).
- 7.5.6 Geologic cross-section from borings/excavations (if applicable).
- 7.5.7 Discussion of any sampling or analytical anomalies.

**7.6 Utility/utility corridor investigation** (if conducted)

- 7.6.1 Detailed site map showing buried utilities, service connections, and any soil contamination and investigation points.
- 7.6.2 Description of utility construction materials (including gaskets), bedding materials, and any other information pertinent to contaminant permeation or migration.
- 7.6.3 Description of test pits, boring completion, or other utility excavation or inspection results.
- 7.6.4 Field observations of utility construction, contamination present, and condition of utilities. Include any other observations pertinent to contaminant permeation or migration.
- 7.6.5 Field screening results in table form with date and time of measurement, depth, location, penetration measurement if taken.
- 7.6.6 Soil sample results.
- 7.6.7 Groundwater sampling results (if groundwater is encountered and sampled from excavation/borings).
- 7.6.8 Depth to water and water table elevation measurements (if water is encountered in excavation/borings).

- 7.6.9 Geologic cross-section from borings/excavations showing utility corridors in relation to contamination (if applicable).
- 7.6.10 Observations, field screening data, and sample results from material inside utilities (vapors, water, gas...). (if sampled)
- 7.6.11 Discussion of any sampling or analytical anomalies.

**7.7 Soil vapor survey** (if conducted)

- 7.7.1 Detailed site map showing all vapor sampling locations.
- 7.7.2 Description of surface and subsurface structures that may influence the migration of vapors through the soil.
- 7.7.3 Description of soil vapor sampling points and soil conditions recorded during driving of sampling points (if taken).
- 7.7.4 Field observations made during sampling.
- 7.7.5 Field screening, qualitative, or quantitative results in table form with date and time of measurement, depth, location, penetration measurement if taken.
- 7.7.6 Groundwater sampling results (if groundwater is encountered and sampled from vapor sampling points).
- 7.7.7 Depth to water and water table elevation measurements (if water is encountered in sampling points).
- 7.7.8 Geologic cross-section from borings/excavations showing vapor concentrations (if applicable).
- 7.7.9 Isopleth map(s) showing vapor concentrations.
- 7.7.10 Discussion of any sampling or analytical anomalies.

**7.8 Building/structure vapor survey** (if conducted)

- 7.8.1 Detailed site map showing all vapor sampling locations in relation to petroleum contamination (soil, free product, groundwater, and soil vapors) to the extent known.
- 7.8.2 Description of surface and subsurface structures that may influence the migration of vapors through the soil.
- 7.8.3 Description of structure vapor sampling points and other conditions within structures that may influence migration of vapors or vapor sampling results.
- 7.8.4 Field observations made during sampling. Inventory of petroleum products stored in or near each structure sampled.
- 7.8.5 Field screening, including qualitative and quantitative results, in table form with date and time of measurement.
- 7.8.6 Discussion of any sampling or analytical anomalies.

**8. CONCLUSIONS** (include only those discussions that are pertinent to investigations conducted under the approved ISA CAP)

- 8.1 Discussion of site history, release information, and potential for the release to impact human health or the environment.
- 8.2 Summarize known and potential completed exposure pathways. [Discuss eliminated pathways and pathways that still may be completed. Include level of certainty to any conclusions.]
- 8.3 Summarize known and potential threats to human health and the environment.

- 8.4 Discussion of Sampling results and comparison of sample levels to regulatory standards and screening levels.
- 8.5 Discussion of vertical extent of soil contamination and potential for future leaching of contamination to groundwater.
- 8.6 Discussion of groundwater contamination and potential of groundwater contamination to impact human health or the environment.
- 8.7 Discussion of groundwater flow characteristics (i.e.: flow direction, velocity, gradient, etc.)
- 8.8 Discussion of fate and transport of contaminants from known and suspected sources.
- 8.9 Discussion of contamination in contact with or in proximity to utilities.
- 8.10 Discussion of current and potential future utility impacts (permeation, transport along backfill...etc.) and potential risks to human health.
- 8.11 Discussion of extent and magnitude of vapors present in soil and potential to impact receptors.
- 8.12 Discussion of vapor distribution within buildings monitored.

## **9. RECOMMENDATIONS**

- 9.1 Recommend release for closure, or
- 9.2 Recommend additional data collection, or corrective actions.
  
- 9.3 Signature page (signed and dated).

## **10. LIMITATIONS**

## **11. REFERENCES**

## **12. APPENDICES (include only those that apply)**

- 12.1 Sampling methods.
- 12.2 Boring logs.
- 12.3 Well completion logs.
- 12.4 Vapor logs.
- 12.5 Field data sheets.
- 12.6 Other logs.
- 12.7 Analytical results and chain of custody forms.
- 12.8 Other data.
- 12.9 EPA notification forms.
- 12.10 QA/QC Plan (unless on file with DEQ) SOP (unless on file with DEQ).

